

## D. Medicines & Drugs (SL)

### D.1 Pharmaceutical Products

- ☐ List the effects of medicines and drugs on the functioning of the body.
- ☐ Outline the stages involved in the research, development and testing of new pharmaceutical products.
- ☐ Describe the different methods of administering drugs.
- ☐ Discuss the terms therapeutic window, tolerance and side-effects.

### D.2 Antacids

- ☐ State and explain how excess acidity in the stomach can be reduced by the use of different bases.

### D.3 Analgesics

- ☐ Describe and explain the different ways that analgesics prevent pain.
- ☐ Describe the use of derivatives of salicylic acid as mild analgesics, and compare the advantages and disadvantages of using aspirin and paracetamol (acetaminophen).
- ☐ Compare the structures of morphine, codeine and diamorphine (heroin, a semi-synthetic opiate).
- ☐ Discuss the advantages and disadvantages of using morphine and its derivatives as strong analgesics.

### D.4 Depressants

- ☐ Describe the effects of depressants.
- ☐ Discuss the social and physiological effects of the use and abuse of ethanol.
- ☐ Describe and explain the techniques used for the detection of ethanol in the breath, the blood and urine.
- ☐ Describe the synergistic effects of ethanol with other drugs.
- ☐ Identify other commonly used depressants and describe their structures.

### D.5 Stimulants

- ☐ List the physiological effects of stimulants.
- ☐ Compare amphetamines and epinephrine (adrenaline).
- ☐ Discuss the short and long-term effects of nicotine consumption.
- ☐ Describe the effects of caffeine and compare its structure with that of nicotine.

### D.6 Antibacterials

- ☐ Outline the historical development of penicillins.
- ☐ Explain how penicillins work and discuss the effects of modifying the side-chain.
- ☐ Discuss and explain the importance of patient compliance and the effect of penicillin overprescription.

### D.7 Antivirals

- ☐ State how viruses differ from bacteria.
- ☐ Describe the different ways in which antiviral drugs work.
- ☐ Discuss the difficulties associated with solving the AIDS problem.

(HL only)

### D.8 Drug Action

- ☐ Describe the importance of geometrical isomerism in drug action.
- ☐ Discuss the importance of chirality in drug action.
- ☐ Explain the importance of the beta-lactam ring action in penicillin
- ☐ Explain the increased potency of diamorphine (heroin) compared to morphine.

### D.9 Drug Design

- ☐ Discuss the use of a compound library in drug design.
- ☐ Explain the use of combinational and parallel chemistry to synthesize new drugs.
- ☐ Describe how computers are used in drug design.
- ☐ Discuss how the polarity of a molecule can be modified to increase its aqueous solubility and how this facilitates its distribution around the body.
- ☐ Describe the use of chiral auxiliaries to form the desired enantiomer.

### D.10 Mind-altering Drugs

- ☐ Describe the effects of lysergic acid diethylamide (LSD), mescaline, psilocybin and tetrahydrocannabinol (THC).
- ☐ Discuss the structural similarities and differences between LSD, mescaline and psilocybin.
- ☐ Discuss the arguments for and against the legalization of cannabis.